CLAIMS

1. Optical resonator with a solid state amplifying medium, this optical resonator being pulsed and pumped by diodes operating continuously, and characterised in that it comprises:

- at least two laser rods,
- at least one means of triggering light pulses, this triggering means being located in the part of the resonator in which the laser beam generated by the resonator diverges least, and
- two mirrors that delimit this resonator, one being highly reflecting and the other being partly reflecting.

2. Optical resonator according to claim 1, in which the laser rods are made of isotropic material such as Nd : YAG or Yb : YAG, the cavity also comprising a polarisation rotation means on the path of the beam in each of the spaces formed by two successive rods, this rotation preferably being 90°.

3. Optical resonator according to claim 1, also comprising a preferably divergent lens, in the middle of each interval between two adjacent rods.

4. Optical resonator according to claim 1, in which the laser material from which the laser rods are made is chosen in the group comprising Nd : YAG, Nd : YLF, Nd : YALO, Yb : YAG, Nd : ScO_3 and Yb : Y_2O_3.

5. Optical resonator according to either of claims 1 and 2, comprising two rods (38a, 38b) made of a laser material, preferably substantially identical, and polarisation rotation means placed in the cavity between these two rods.

6. Optical resonator according to claim 3, in which the means of triggering pulses placed in each pulsed optical resonator comprises two Q-switches located in the cavity, on each side of the polarisation rotation means, between the polarisation rotation means and the laser rods.

7. Optical resonator according to either of claims 1 to 4, in which the triggering means (50, 52) are of the acousto-optical type.

8. Optical resonator according to claim 1, associated with one or several single pass amplifiers.

9. Laser device, characterized in that it comprises:

- at least three pulsed optical resonators (2, 4, 6) according to any one of claims 1 to 3 and 8, and
- means (14) for transferring these light pulses to substantially the same location on a target (16) and at substantially the same time at this location,

and in that the device also comprises means (18) of controlling the pulsed optical resonators, these control means being designed so that all triggering means forming part of the device operate synchronously.

10. Device according to claim 9, comprising at least ten pulsed optical resonators (2, 4, 6) in parallel.

11. Device according to any one of claims 9 and 10, in which the means of sending light pulses comprise means (80, 82, 90, 92) of sending these light pulses onto the target (16) along the same path.

12. Device according to any one of claims 9 to 11, also comprising means (74, 76, 78) of modifying the spatial distribution of the light pulse resulting from the addition of light pulses output by the optical resonators.

13. Device according to any one of claims 9 to 12, in which means (18) of controlling the optical resonators are also capable of modifying the time distribution of the light pulse resulting from the addition of light pulses supplied by the optical resonators, in order to create composite pulses.

14. Device according to claim 13, in which the profile of each composite pulse comprises a first plasma ignition pulse that will be created by interaction of the light pulses with the target, a time interval in which the light energy output by the laser is minimum during plasma growth, and then a second pulse composed of several elementary pulses according to a sequence that depends on plasma growth.

15. Device according to any one of claims 9 to 14, also comprising means (18) of modifying the recurrence rate of light pulses emitted by the optical resonators or the sequence of these light pulses emitted by the optical resonators.

16. Device according to claim 13, capable of sending a first highly focused beam (F1) onto the target and then applying the remainder of the light energy onto the target with broader focusing.

17. Device according to any one of claims 9 to 16, in which the target (16) is designed to output light in the extreme ultraviolet domain by interaction with the light pulses emitted by the optical resonators (2, 4, 6).